

ADAPTIVE MANAGEMENT PROGRAM

Using Science to Manage River Resources in Grand Canyon



Endangered Species

The Endangered Species Act (ESA) calls upon all Federal agencies to conserve endangered and threatened species and insure that agency actions are not likely to jeopardize the continued existence of those species or result in the destruction or adverse modification of their critical habitat, consistent with applicable federal law.

Responsibilities under the Endangered Species Act of 1973

A goal of the Adaptive Management Program (AMP) is to be consistent with the ESA. Full restoration of the pre-dam ecosystem and annual and seasonal river flows and temperatures are not realistic objectives for the AMP. However, efforts to regain the function of the river and its ecological attributes so that the most disadvantaged species along the river are not jeopardized with extinction are laudable goals and are fully consistent with the ESA. Operational activities undertaken by federal agencies that may affect threatened and endangered species - which were recommended by the AMP - must be consulted upon with the U.S. Fish and Wildlife Service.

Endangered Species Affected by River Operations

Glen, Marble and Grand canyons are treasure troves of threatened, endangered and recovered species (see inset box). River operations do not affect all of these species. However, flow releases that may affect the southwestern willow flycatcher, humpback chub, razorback sucker and Kanab ambersnail are routinely considered by the AMWG.

Southwestern willow flycatcher

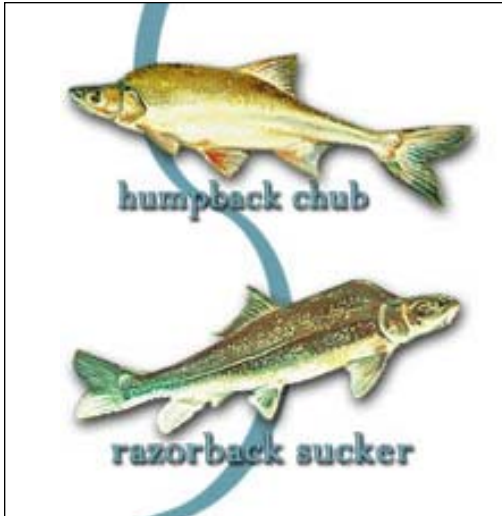
This small, endangered, migratory bird returns to the Southwest to breed each spring and summer. Small populations of southwestern willow flycatchers breed in dense riparian vegetation along the Colorado River in Grand Canyon. Breeding populations use the narrow riparian corridor through the canyon; however, broader expanses of flycatcher habitat are found downstream at upper Lake Mead. Flycatchers tend to breed in dense, young willow and saltcedar stands over water or moist soils. This breeding habitat is dynamic, growing out of suitability and then being rejuvenated or replaced by flood events, or contracting and expanding by scouring and sediment deposition.

AMP efforts to restore sediment deposition through flow experiments create new beaches upon which riparian habitat can become established. While experimental floods may immediately reduce ground cover and low lying branches in some flycatcher habitat, they open new patch areas for establishing dense new plants and can improve habitat in the long term.

Threatened and Endangered Species of Glen, Marble and Grand Canyons

Southwestern willow flycatcher (endangered)*
Bald eagle (threatened)
Mexican spotted owl (threatened)
California condor (endangered)
Peregrine falcon (recovered)
Humpback chub (endangered)*
Razorback sucker (endangered)*
Kanab ambersnail (endangered)*
Colorado pikeminnow (endangered)*
Bonytail chub (endangered)*
Sentry milk-vetch (endangered)
Siler pincushion cactus (threatened)

*Riverine/riparian species affected by
Glen Canyon Dam operations



Humpback chub¹

This large (20 in) endangered minnow occurred throughout the Colorado River and its tributaries in Grand Canyon. Among other factors, greatly reduced water temperatures, changes in daily and seasonal river flows from dam operations, and increased competition and predation by non-native fishes aided by dam operations, have detrimentally impacted the humpback chub and other species. Spawning and young survival are primarily limited to the Little Colorado River and areas near the confluence of this tributary with the mainstem river.

The AMP has worked to improve humpback chub populations and we've seen stabilization in this species numbers. The magnitude of daily river fluctuations has been reduced and flow experiments are being conducted to attempt to improve habitat for humpback chub. Trout, carp and other non-native fishes are being mechanically removed from the mainstem river in the

vicinity of the Little Colorado River confluence (an area approximately 60 miles downstream of Lees Ferry). Flow and sediment deposition experiments are designed to improve native fish rearing habitat. The Bureau of Reclamation is investigating the feasibility of installing a selective withdraw structure² at Glen Canyon Dam that will allow for the flexible release of warmer water more suitable to chub spawning and survival of their young.

Razorback sucker

This long-lived sucker can reach three feet in length and has a prominent "keel" behind its head. It is magnificently adapted to living in the wild rivers of the Southwest - swift and turbulent spring runoffs, low fall and winter flows and prolonged droughts. Yet, razorbacks do not spawn in reservoir-chilled waters. Their young are eaten by non-native species and succumb to competitive pressures of non-native fishes. Razorbacks have become very rare in Grand Canyon, and may be absent; although a reproducing population still occurs in Lake Mead, just downstream.

Many of the AMP programs designed to benefit the humpback chub are also designed to restore conditions essential to a healthy razorback population. Conservation of all native fish in Grand Canyon is a recognized AMP goal.

Kanab ambersnail

This small (3/4 in) terrestrial snail is known to historically occur at only three locations. One is along the Colorado River in Grand Canyon. Vaseys Paradise is a monkey flower- and watercress-dominated area created by a perennial stream flowing from the base of a limestone cliff. The ambersnail is found in this unique habitat. Lower portion of the snail's habitat and snails can be swept way when the Colorado River floods.

In advance of experimental high flows, the AMP established a refugium population of Kanab ambersnails at Upper Elves Chasm in Grand Canyon. Additionally, low-lying sod-like patches of snail habitat have been removed prior to experimental floods and successfully replanted once water levels subside.

¹See Native Fish Fact Sheet for description of this species and its natural history.

²See Glen Canyon Dam Temperature Control Device Fact Sheet.